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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,473	12/26/2001	Yoshiyuki Miyamoto	NE246-US	2990
466	7590	12/15/2005		
YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202			EXAMINER KOPEC, MARK T	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 12/15/2005

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Application Number: 10/025,473  
Filing Date: December 26, 2001  
Appellant(s): MIYAMOTO, YOSHIYUKI

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Philip DuBois  
For Appellant

EXAMINER'S ANSWER

**MAILED**  
DEC 15 2005  
**GROUP 1700**

This is in response to the appeal brief filed 08/22/05 appealing  
from the Office action mailed 07/01/04.

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**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

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**(8) Evidence Relied Upon**

Margadonna et al (Chem Mater. 1999) (of record) is discussed in the (10) Response to Argument section.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not enable one of ordinary skill in the art to make or use a superconductor comprising C20 fullerene molecules polymerized into a one-dimensional chain (or methods of making such materials), in that it would require undue experimentation to do so.

The quantum of proof required to establish enablement is inextricably linked with the degree of unpredictability of the relevant art. See MPEP 2164.03.

The art of high temperature (above 30K) superconductors is an extremely unpredictable one. Small changes in composition can result in dramatic changes in or loss of superconducting properties. The amount and type of examples necessary to

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support broad claims increases as the predictability of the art decreases. See In re Fisher, 166 USPQ 18, 24 and In re Angstadt and Griffen, 190 USPQ 214, 218. Claims broad enough to cover a large number of compositions that do not exhibit the desired properties fail to satisfy the requirements of 35 USC 112. See In re Cook, 169 USPQ 298, 302 and Cosden Oil v. American Hoechst, 214 USPQ 244, 262. Merely reciting a desired result does not overcome this failure. In re Corkill, 226 USPQ 1005, 1009.

In the instant specification, applicant has not specifically disclosed any **conclusive evidence** that the claimed materials have been produced (or methods of making such materials). Applicant alludes to critical temperatures above 180K (page 6, Fig 3), but no "hard data" has been provided (actual temperature vs. resistivity plots, photomicrographs, etc) to support applicant's contention of such incredible superconductive properties. In fact, no inventive examples appear in the specification. It is unclear if applicant has produced C20 fullerene molecules polymerized into a one-dimensional chain, or if such is only a theoretical discussion. At page 6 of the specification, applicant states:

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Therefore, the transition temperature of  $C_{30}$  Fullerene molecule is  $e^{1/2}$  times (about 4.5 times) higher than the superconducting transition temperature of  $C_{60}$  Fullerene molecule (40 K) and can be expected to be as large as 180 K which is comparable to a transition temperature of a high-temperature superconducting material.

In view of the above-described consideration, Figure 3 shows the simulated results of a change in electric resistance by temperature. The resistance values are not absolute values and are normalized such that the resistance at room temperature is 1. According to the first-principle calculation, when  $C_{30}$  Fullerene molecules are polymerized in a three-dimensional manner, they undergo phase transition and relax from a closed cage structure to an open structure. Since such phase transition weakens the electron-lattice interaction, three-dimensional polymerization has to be avoided.

It appears from this description (of simulated results) that applicant has not actually produced/tested the claimed materials.

It should be noted that at the time the invention was made, the theoretical mechanism of superconductivity in these materials was not well understood. (This is still the case today). Accordingly, there appears to be little factual or theoretical basis for extending the scope of the claims much beyond the proportions and materials actually demonstrated to exhibit high temperature superconductivity. A "patent is not a hunting license. It is not a reward for the search, but a

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reward for its successful conclusion", Brenner v. Manson, 383 US 519, 148 USPQ 689.

As discussed by Professor Chu in a lecture at the Patent and Trademark Office in October 7, 1987, there are generally four measures of superconductivity: (1) zero resistivity, (2) exhibition of the Meissner effect, (3) stability to survive thermal cycling and (4) reproducibility. In the absence of zero resistivity and evidence from the Meissner effect, the sharp resistance drops may be taken only as an indication of the possible existence of superconductivity at unusually high temperatures. Resistivity drops alone are dangerous measure of superconductivity because the drops could be related to problems with testing techniques. Therefore, the current state of the superconducting art suggests that at least zero resistivity at a reproducible temperature which also shows the Meissner effect is the minimum showing necessary to claim that applicant has produced a material which exhibits superconductivity at very high temperatures.

**(10) Response to Argument**

Claims 1-8

Appellant's discussion of the prosecution history at page 3 of the Brief is noted.

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Citing MPEP §2107.01 (IV), appellant contends that as the 35 USC 101 rejection has been withdrawn, the 112, ¶1 should be withdrawn as a matter of course. In re Cortright, 165 F.3d 1353, 49 USPQ2d 1464 (Fed. Cir. 1999) is cited in support.

The examiner respectfully disagrees. The examiner submits the pending 35 USC 112, ¶1, rejection is directed to lack of enablement, not "lack of utility". A careful reading of MPEP §2107.01 (IV) states:

It is important to recognize that 35 U.S.C. 112, first paragraph, addresses matters other than those related to the question of whether or not an invention lacks utility. These matters include whether the claims are fully supported by the disclosure (In re Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991)), whether the applicant has provided an enabling disclosure of the claimed subject matter (In re Wright, 999 F.2d 1557, 1561-1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993))...The fact that an applicant has disclosed a specific utility for an invention and provided a credible basis supporting that specific utility does not provide a basis for concluding that the claims comply with all the requirements of 35 U.S.C. 112, first paragraph. For example, if an applicant has claimed a process of treating a certain disease condition with a certain compound and provided a credible basis for asserting that the compound is useful in that regard, but to actually practice the invention as claimed a person skilled in the relevant art would have to engage in an undue amount of experimentation, the claim may be defective under 35 U.S.C. 112, but not 35 U.S.C. 101. To avoid confusion during examination, any rejection under 35 U.S.C. 112, first paragraph, based on grounds other than "lack of utility" should be imposed separately from any rejection imposed due to "lack of utility" under 35 U.S.C. 101 and 35 U.S.C. 112, first paragraph.



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Accordingly, it appears proper procedure to maintain the instant rejection under 35 USC 112 even after withdrawal if the previous 35 USC 101 rejection. Additionally, the 101/112 issues discussed in *In re Cortright* appear to deal with claim construction and term definition, such as the scope and meaning of the term "restoring hair growth". The determining factors in the decision do not appear similar to the instant appeal.

Appellant argues "...the examiner has determined that a prophetic disclosure in an allegedly "unpredictable" art should receive an automatic downgrade in credibility".

This is not the case. Use of "prophetic" examples does not automatically make a patent non-enabling merely because there can be no guarantee that the examples would actually work. *Atlas Powder Co. v. E.I. Dupont de Nemours & Co.* (CAFC 1984) 750 F2d 1569, 224 USPQ 409. However, such is a factor to be considered, especially in an unpredictable art (such as superconductivity). It is the instant disclosure in its entirety that has been considered. The specification need not contain an example if the invention is otherwise disclosed in such manner that one skilled in the art will be able to practice it without an undue amount of experimentation. *In re Borkowski*, 422 F.2d 904, 908, 164 USPQ 642, 645 (CCPA 1970). Lack of a working example, however, is a factor to be considered,

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especially in a case involving an unpredictable and undeveloped art. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. In contrast, if little is known in the prior art about the nature of the invention and the art is unpredictable, the specification would need more detail as to how to make and use the invention in order to be enabling. >See, e.g., Chiron Corp. v. Genentech Inc., 363 F.3d 1247, 1254, 70 USPQ2d 1321, 1326 (Fed. Cir. 2004). In the instant application, appellant discloses a detailed theoretical discussion relating to chain structure, dispersion of energy bands, bonding between Fullerene molecules, and critical temperature (pages 4-6). However, the instant specification is devoid of specific details relating to the production of the claimed superconductors. Page 7, Lines 7-11 state:

Then, using capillarity, the C20 Fullerene molecules are incorporated into a porous material having a large band gap between the valence band and the conduction band, such as zeolite or a BN nanotube. As a result, spontaneous polymerization reaction takes place at about room temperature, thereby producing a chain polymer 5 of C20

The procedure disclosed above makes no reference to process conditions such as atmosphere, mixing ratio, or reaction time.

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Are any special gasses or liquids necessary? Is there any specific process utilized to remove the formed superconductive Fullerene polymers? As the instant specification appears, such determinations cannot be made without undue experimentation by one of ordinary skill in the art. Margadonn et al (Chem. Mater.) (of record) discusses in great detail the importance of process parameters such as atmosphere, temperature and pressure as they relate to the formation of high pressure phases of alkali-Fullerene materials. Under several process conditions, the reference fails to produce polymeric structures (page 2964, left hand column; page 2965).

The examiner respectfully submits, after careful consideration of the evidence as a whole, that appellant has failed to provided an enabled disclosure with respect to the production of superconductive C20 Fullerene molecules polymerized into a one-dimensional chain.

Independent patentability of Claims 4-8.

The instant disclosure relating to claims 4-8 (injection of holes or elections) provides not additional guidance with respect to the production of C20 Fullerene molecules polymerized into a one-dimensional chain. The examiner respectfully submits the disclosure relating to these claims (page 7, lines 14-27 of

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the specification) does not cure the deficiencies discussed above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.


Respectfully submitted,

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Primary Examiner  
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